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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/723,041	11/26/2003	Bruce Edward LaVigne	200311029-1	7830

22879 7590 04/01/2008

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EXAMINER	
DUONG, THOMAS	
ART UNIT	**PAPER NUMBER**
2145	

NOTIFICATION DATE	DELIVERY MODE
04/01/2008	ELECTRONIC

Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

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Office Action Summary	Application No.	Applicant(s)	
	10/723,041	LAVIGNE ET AL.	
	Examiner	**Art Unit**	
	THOMAS DUONG	2145	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _3_ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on _02 January 2008_.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) _1-12, 14-23, and 25-29_ is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) _1-12, 14-23, and 25-29_ is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on _26 November 2003_ is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Request for Continued Examination

1. A request for continued examination under 37 CFR 1.114, including the fee set forth in 37 CFR 1.17(e), was filed in this application after final rejection. Since this application is eligible for continued examination under 37 CFR 1.114, and the fee set forth in 37 CFR 1.17(e) has been timely paid, the finality of the previous Office action has been withdrawn pursuant to 37 CFR 1.114.

2. Amendment received January 10, 2008 has been entered into record. *Claims 1-12, 14-23, and 25-29* remain pending.

Response to Amendment

3. This office action is in response to the Applicants' Amendment filed on January 10, 2008. Applicants amended *claims 1, 15, 18, 26, and 29* and canceled *claims 13 and 24. Claims 1-12, 14-23, and 25-29* are presented for further consideration and examination.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. *Claims 1, 5-7, 10-12, 14, 17-19, 21-23, 25, and 28* are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussiere (US006041042A), in view of Amara et al. (US006839338B1), in view of Zhang et al. (US006985935B1), and further in view of Ni (US007042843B2).

6. With regard to *claims 1 and 18*, Bussiere discloses,

- *receiving by an entry device a data packet to be remotely mirrored from the first network layer 2 domain, wherein the entry device is pre-configured with a destination Internet Protocol (IP) address to which to mirror the data packet, and the destination IP address is associated with a remote exit device in the second network layer 2 domain;* (Bussiere, col.1, line 5 – col.10, line 65)
  Bussiere discloses, *"FIG. 2 illustrates, by way of example, part of a network system in which a source device is monitored by a remote analyzer. The source device is referred to as an ingress device 15 for so long as the device is being monitored, and can be any one of the network communication devices (e.g., devices 1-4, 6 and 9 in FIG. 1). Ingress device 15 may have multiple ports through which packets may be received and sent. In FIG. 2, port 13 has been selected as the port to be monitored. Thus, in this example, device 15 is the ingress device and port 13 is the "mirror-from-port." A "mirror-to-port" 14 is the out port on ingress device 15 that is on a path 12 set up through the connection-oriented network 10 to the egress device 18. All packets received and sent by the port 13 are also copied and transmitted through the network 10 to analyzer 5, located off analyzer port 11 of egress device 18. The "egress device" is the device on the network that is used to monitor the mirror-from-port 13 on the*

ingress device 15. Any device may be selected as the egress device" (Bussiere, col.4, line 66 – col.5, line 17). Hence, Bussiere teaches of the ingress device 15 (i.e., Applicants' entry device) receiving packets (i.e., Applicants' data packet) that are being monitored through port 13 (e.g., "mirror-from-port") (i.e., Applicants' to be monitored) and transmitting them through "mirror-to-port" 14 to the egress device 18 (i.e., Applicants' remote mirrored device). Bussiere discloses, *"In step 41, a port on a device in the network is selected to be monitored (i.e., a device is designated as an ingress device). Special hardware (and/or software) is set-up in the ingress device (e.g., 15), defining one port (e.g., port 13) as the "mirror-from-port" and one port (e.g., port 14) as "mirror-to-port". In step 42, frame encapsulation logic (e.g., 15') is set up in the ingress device (e.g., 15). In step 43, a path, (e.g., path 12), is set-up from a specific out-port of the ingress device (e.g., "mirror-to-port" 14) through the trunk devices (e.g., 16 and 17) to the egress device (e.g., 18)"* (Bussiere, col.6, lines 41-50). Hence, Bussiere teaches of the ingress device (e.g., "mirror-to-port" 14) (i.e., Applicants' entry device) is set up (i.e., Applicants' configured) with a path through the use of source and destination addresses (i.e., Applicants' destination IP address) so that data is forwarded to the egress device (i.e., Applicants' destination which mirror the data packet, remote exit device).

- *<u>generating and adding an</u> IP <u>header to</u> IP <u>encapsulate the data packet, wherein the</u> IP <u>header includes the destination</u> IP <u>address; and</u>* (Bussiere, col.1, line 5 – col.10, line 65)

  Bussiere discloses, *"According to a method embodiment, the invention comprises the steps of: selecting a first port of a first device from which to mirror*

packets; selecting a first port of a second device to which to mirror the packets; and mirroring the packets from the first port of the first device to the first port of the second device by encapsulating the packets and sending the encapsulated packets through the network to the second device. The first device encapsulates the packets, enabling them to be transmitted out the network to the second device; the second device de-encapsulates the encapsulated packets, and provides the same to an analyzer. The mirroring step may include establishing a connection path through a switched network from the first device to the second device and sending the encapsulated packets on the path. The step of encapsulating the packets may include adding a header which identifies the connection path" (Bussiere, col.2, lines 27-46). Hence, Bussiere teaches of the first device (i.e., Applicants' entry device) encapsulating the packets (i.e., Applicants' data packet) by including (i.e., Applicants' adding) headers identifying (i.e., Applicants' includes) the address of the destination (i.e., Applicants' destination address) device.

- <u>forwarding the</u> *IP*-<u>encapsulated packet to an exit device associated with the destination</u> *IP* <u>address.</u> (Bussiere, col.1, line 5 – col.10, line 65)

  Bussiere discloses, *"According to a method embodiment, the invention comprises the steps of: selecting a first port of a first device from which to mirror packets; selecting a first port of a second device to which to mirror the packets; and mirroring the packets from the first port of the first device to the first port of the second device by encapsulating the packets and sending the encapsulated packets through the network to the second device. The first device encapsulates the packets, enabling them to be transmitted out the network to the second*

device; the second device de-encapsulates the encapsulated packets, and provides the same to an analyzer. The mirroring step may include establishing a connection path through a switched network from the first device to the second device and sending the encapsulated packets on the path. The step of encapsulating the packets may include adding a header which identifies the connection path" (Bussiere, col.2, lines 27-46). Hence, Bussiere teaches of the first device (i.e., Applicants' entry device) encapsulating the packets (i.e., Applicants' data packet) by including (i.e., Applicants' adding) headers identifying (i.e., Applicants' includes) the address of the destination (i.e., Applicants' destination address) device and transmitting (i.e., Applicants' forwarding) them (i.e., Applicants' encapsulated packet) to the second device (i.e., Applicants' exit device) through the network based on the destination address (i.e., Applicants' associated with the destination address).

However, Bussiere does not explicitly disclose,

- *generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address;*
- *forwarding the IP-encapsulated packet to an exit device associated with the destination IP address; and*

Amara teaches,

- *generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address;* (Amara, col.1, line 7 – col.18, line 38)

  Amara discloses, *"IP can be used to send data between devices on the same network and between devices on different networks. For IP communications, a*

device is generally assigned a 32-bit IP address. The IP address is generally globally unique across the connected networks, and this allows the destination device to be uniquely identified by its IP address. Data is transmitted in an IP packet. The IP packet includes a header portion and a data portion" (Amara, col.3, lines 31-38). Amara discloses, *"The virtual tunnel 126 can be created by encapsulating a data packet inside another data packet and by adding additional tunnel packet headers"* (Amara, col.6, lines 43-45). Hence, Amara implies of IP encapsulating data packets using IP headers and transmitting them to the destination based on the destination IP address of the IP header through devices on different networks.

- <u>*forwarding the IP-encapsulated packet to an exit device associated with the destination IP address; and*</u> (Amara, col.1, line 7 – col.18, line 38)

  Amara discloses, *"IP can be used to send data between devices on the same network and between devices on different networks. For IP communications, a device is generally assigned a 32-bit IP address. The IP address is generally globally unique across the connected networks, and this allows the destination device to be uniquely identified by its IP address. Data is transmitted in an IP packet. The IP packet includes a header portion and a data portion"* (Amara, col.3, lines 31-38). Amara discloses, *"The virtual tunnel 126 can be created by encapsulating a data packet inside another data packet and by adding additional tunnel packet headers"* (Amara, col.6, lines 43-45). Hence, Amara implies of IP encapsulating data packets using IP headers and transmitting them to the destination based on the destination IP address of the IP header through devices on different networks.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Amara with the teachings of Bussiere *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via IP encapsulation.

However, Bussiere and Amara do not explicitly disclose,

- *receiving by an entry device a data packet to be remotely mirrored <u>from the first network layer 2 domain,</u> wherein the entry device is pre-configured with a destination Internet Protocol (IP) address to which to mirror the data packet, and the destination IP address is associated with a remote exit device <u>in the second network layer 2 domain;</u>*

Zhang teaches,

- *receiving by an entry device a data packet to be remotely mirrored <u>from the first network layer 2 domain,</u> wherein the entry device is pre-configured with a destination Internet Protocol (IP) address to which to mirror the data packet, and the destination IP address is associated with a remote exit device <u>in the second network layer 2 domain;</u>* (Zhang, col.1, line 6 – col.16, line 33)

  Zhang discloses, *"Once the Layer 2 tunnel is setup and a necessary link is established, the LNS typically assigns an IP address to an authenticated client, and sends it to the network access device over the Layer 2 tunnel. The network access device receives the IP address and transfers it to the client (129)."* (Zhang, col.9, lines 20-24). Hence, Zhang teaches of communicating between networks through layer 2 encapsulation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Zhang with the teachings of Bussiere and Amara *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber*

optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh" (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation.

However, Bussiere, Amara, and Zhang do not explicitly disclose,

- *configuring the entry device in a best effort mirroring mode to reduce head-of-line blocking.*

Ni teaches,

- *configuring the entry device in a best effort mirroring mode to reduce head-of-line blocking.* (Ni, col.1, line 10 – col.14, line 40)

  Ni discloses, *"The issue then becomes how does a system manage the scheduling of the transmission of the packets so that no voice or video transmission interval violation occurs and no best effort starvation occurs. An embodiment of the invention addresses this issue by providing a method to restrict the total number of active class of services (flows) for voice and video packets so that 1) the maximum wait time for any port's voice/video queue is less than or equal to the maximum transmission interval (i.sub.m), 2) the process of interleaving voice, video and best effort traffic does not delay the transmission of the next voice/video packet transmit time, and 3) the process does not starve the video and best effort traffic for service"* (Ni, col.7, lines 17-29). Hi discloses, *"HOL blocking is a phenomenon that may occur in an input buffered switch wherein a packet is temporarily blocked by another packet or packets either at*

> *the input buffer or at the output buffer. HOL reduces the effectiveness of the transfer rate. One of the objectives of flow control is to inhibit the sending station or host from sending additional packets to a congested port for a predetermined amount of time. While a flow control scheme is expected to ease congestion, it may also aggravate the Head-of-Line (HOL) blocking problem by causing additional transmission delays"* (Ni, col.7, lines 7-16). Hence, Ni teaches of utilizing best effort transmission method among others to avoid that starvation of best effort traffic for service and reducing the head-of-line (HOL) blocking and congestion problems.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Ni with the teachings of Bussiere, Amara, and Zhang *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-

28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation. Ni discloses, *"The issue then becomes how does a system manage the scheduling of the transmission of the packets so that no voice or video transmission interval violation occurs and no best effort starvation occurs"* (Ni, col.7, lines 17-20).

7. With regard to *claims 5-7 and 19,* Bussiere, Amara, Zhang, and Ni disclose,

- *further comprising: receiving the IP-encapsulated packet by the exit device; and removing the IP header to de-encapsulate the packet.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)

  Bussiere discloses, *"The first device encapsulates the packets, enabling them to be transmitted out the network to the second device; the second device de-encapsulates the encapsulated packets, and provides the same to an analyzer. The mirroring step may include establishing a connection path through a switched network from the first device to the second device and sending the encapsulated packets on the path. The step of encapsulating the packets may including adding a header which identifies the connection path"* (Bussiere, col.2, lines 38-46).
- *wherein the remote mirroring preserves an original format of the data packet.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)

- *further comprising: pre-configuring the entry device to mirror data packets from at least one specified port of the entry device.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)

8. With regard to *claims 10-12, 14, 21-23, and 25*, Bussiere, Amara, Zhang, and Ni disclose,

- *further comprising: pre-configuring the entry device to mirror data packets which include IP addresses that matches at least one entry in an IP hash table.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)
  Bussiere discloses, *"FIG. 2 illustrates, by way of example, part of a network system in which a source device is monitored by a remote analyzer. The source device is referred to as an ingress device 15 for so long as the device is being monitored, and can be any one of the network communication devices (e.g., devices 1-4, 6 and 9 in FIG. 1). Ingress device 15 may have multiple ports through which packets may be received and sent. In FIG. 2, port 13 has been selected as the port to be monitored. Thus, in this example, device 15 is the ingress device and port 13 is the "mirror-from-port." A "mirror-to-port" 14 is the out port on ingress device 15 that is on a path 12 set up through the connection-oriented network 10 to the egress device 18. All packets received and sent by the port 13 are also copied and transmitted through the network 10 to analyzer 5, located off analyzer port 11 of egress device 18. The "egress device" is the device on the network that is used to monitor the mirror-from-port 13 on the*

ingress device 15. Any device may be selected as the egress device" (Bussiere, col.4, line 66 – col.5, line 17).

- *further comprising: pre-configuring the entry device to mirror data packets which include an IP destination address that matches at least one specified subnet entry in a best matching prefix (BMP) table.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)
- *further comprising: pre-configuring the entry device to mirror data packets matching at least one access control list (ACL) entry.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)
- *further comprising: configuring the entry device in a lossless mirroring mode to assure completeness of mirrored traffic.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)
-

9. With regard to *claims 17 and 28,* Bussiere, Amara, Zhang, and Ni disclose,

- *further comprising: pre-configuring the entry device to mirror data packets which include IP addresses that matches at least one entry in an IP hash table.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40)

  Amara discloses, *"The IPsec services can be applied in one of two modes, a "transport mode" or a "tunnel mode." In the transport mode generally only the IP packet's data is encrypted. The IP packet is routed to the destination devices*

using a destination address (e.g., the IP destination address 72). In the transport mode the destination IP address and the source IP address may both be "visible" (i.e., not encrypted) to other devices on the network. As a consequence, another device may be able to monitor the number of packets sent between a source device and a destination device. However, since the data is encrypted, the device ordinarily will not be able to determine the contents of the data in the IP packets. Once the transport mode packet reaches its final destination, the destination device performs the IPsec processing. For example, the destination device may decrypt the data carried in the IP packet according to an agreed encryption method" (Amara, col.8, lines 50-65).

10. *Claims 2-4, 8-9, and 20* are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussiere (US006041042A), in view of Amara et al. (US006839338B1), in view of Zhang et al. (US006985935B1), in view of Ni (US007042843B2), and further in view of Liu et al. (US 20040184408A1).

11. With regard to *claim 2*, Bussiere, Amara, Zhang, and Ni disclose,

See *claim 1* rejection as detailed above.

However, Bussiere, Amara, Zhang, and Ni do not explicitly disclose,

- *further comprising: determining a media access control (MAC) address associated with the destination IP address; generating and adding a MAC header to the IP-encapsulated packet to form a MAC data frame, wherein the MAC header includes the MAC address in a destination field; and transmitting the*

MAC data frame to communicate the IP-encapsulated packet across the second network layer 2 domain to the remote exit device.

Liu teaches,

- *further comprising: determining a media access control (MAC) address associated with the destination IP address; generating and adding a MAC header to the IP-encapsulated packet to form a MAC data frame, wherein the MAC header includes the MAC address in a destination field; and transmitting the MAC data frame to communicate the IP-encapsulated packet across the second network layer 2 domain to the remote exit device.* (Liu, para.1-34)

  Liu discloses, *"In another embodiment, a medium access control (MAC) encapsulated data packet for distribution over an Ethernet network is disclosed. The MAC encapsulated data packet includes a provider destination MAC address field; a provider source MAC address field; an Ethertype field; and followed by a customer data packet. In other words, the customer data packet encapsulates a provider header that includes the provider destination MAC address field, the provider source MAC address field, and the Ethertype field"* (Liu, para.11).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Liu with the teachings of Bussiere, Amara, Zhang, and Ni *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area*

network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh" (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation. In addition, Brown discloses, *"The resources required for one or more applications may lead one or more conferencing participants to participate in a less resource-intensive manner"* (Brown, col.7, lines 52-55).

12. With regard to *claims 3-4, 8-9, and 20*, Bussiere, Amara, Zhang, Ni, and Liu disclose,

- *wherein determining the MAC address comprises: determining if a mapping of the destination IP address to the MAC address is stored in an address resolution protocol (ARP) cache; if so, then retrieving the MAC address from the ARP cache; and if not, then broadcasting an ARP request with the destination IP address and receiving an ARP reply with the MAC address.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40; Liu, para.1-34)

- *further comprising: pre-configuring the entry device to mirror data packets which include a VLAN tag with at least one specified VLAN identifier.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40; Liu, para.1-34)
- *further comprising: pre-configuring the entry device to mirror data packets which include MAC addresses that matches at least one entry in a MAC look-up table.* (Bussiere, col.1, line 5 – col.10, line 65; Amara, col.1, line 7 – col.18, line 38; Zhang, col.1, line 6 – col.16, line 33; Ni, col.1, line 10 – col.14, line 40; Liu, para.1-34)

13. *Claims 16 and 27* are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussiere (US006041042A), in view of Amara et al. (US006839338B1), in view of Zhang et al. (US006985935B1), in view of Ni (US007042843B2), and further in view of Brown (US007124166B2).

14. With regard to *claims 16 and 27*, Bussiere, Amara, Zhang, and Ni disclose,

See *claims 1 and 18* rejection as detailed above.

However, Bussiere, Amara, Zhang, and Ni do not explicitly disclose,

- *further comprising: compressing at least a portion of the data packet to reduce a size of the IP-encapsulated packet prior to forwarding thereof.*

Brown teaches,

- *further comprising: compressing at least a portion of the data packet to reduce a size of the IP-encapsulated packet prior to forwarding thereof.* (Brown, col.1, lines 8 – col.18, line 23)

Brown discloses, *"Typically, video conferencing application 210A encodes and displays audio and video content. Implementations of video conferencing application 210A use compression to reduce the bandwidth consumed by transmitting the stream of data units. For example, video conferencing protocols and techniques may reduce the resolution, detail, or frame rate to reduce the bandwidth consumed. In another example, the frame-to-frame differences may be encoded for transmission instead of encoding each frame. Similar techniques may be applied to the audio signal. For example, the sampling rate of the audio signal may be reduced or the signal may be compressed"* (Brown, col.7, lines 56-67).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Brown with the teachings of Bussiere, Amara, Zhang, and Ni *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow*

one or more topologies such as a star, ring, bus or mesh" (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation. In addition, Brown discloses, *"The resources required for one or more applications may lead one or more conferencing participants to participate in a less resource-intensive manner"* (Brown, col.7, lines 52-55).

15. *Claims 15 and 26* are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussiere (US006041042A), in view of Amara et al. (US006839338B1), in view of Zhang et al. (US006985935B1), and further in view of Regan (US 20040213232A1).

16. With regard to *claims 15 and 26*, Bussiere discloses,

- *receiving by an entry device a data packet to be remotely mirrored from the first network layer 2 domain, wherein the entry device is pre-configured with a destination Internet Protocol (IP) address to which to mirror the data packet, and the destination IP address is associated with a remote exit device in the second network layer 2 domain;* (Bussiere, col.1, line 5 – col.10, line 65)
  Bussiere discloses, *"FIG. 2 illustrates, by way of example, part of a network system in which a source device is monitored by a remote analyzer. The source device is referred to as an ingress device 15 for so long as the device is being monitored, and can be any one of the network communication devices (e.g., devices 1-4, 6 and 9 in FIG. 1). Ingress device 15 may have multiple ports through which packets may be received and sent. In FIG. 2, port 13 has been*

selected as the port to be monitored. Thus, in this example, device 15 is the ingress device and port 13 is the "mirror-from-port." A "mirror-to-port" 14 is the out port on ingress device 15 that is on a path 12 set up through the connection-oriented network 10 to the egress device 18. All packets received and sent by the port 13 are also copied and transmitted through the network 10 to analyzer 5, located off analyzer port 11 of egress device 18. The "egress device" is the device on the network that is used to monitor the mirror-from-port 13 on the ingress device 15. Any device may be selected as the egress device" (Bussiere, col.4, line 66 – col.5, line 17). Hence, Bussiere teaches of the ingress device 15 (i.e., Applicants' entry device) receiving packets (i.e., Applicants' data packet) that are being monitored through port 13 (e.g., "mirror-from-port") (i.e., Applicants' to be monitored) and transmitting them through "mirror-to-port" 14 to the egress device 18 (i.e., Applicants' remote mirrored device). Bussiere discloses, *"In step 41, a port on a device in the network is selected to be monitored (i.e., a device is designated as an ingress device). Special hardware (and/or software) is set-up in the ingress device (e.g., 15), defining one port (e.g., port 13) as the "mirror-from-port" and one port (e.g., port 14) as "mirror-to-port". In step 42, frame encapsulation logic (e.g., 15') is set up in the ingress device (e.g., 15). In step 43, a path, (e.g., path 12), is set-up from a specific out-port of the ingress device (e.g., "mirror-to-port" 14) through the trunk devices (e.g., 16 and 17) to the egress device (e.g., 18)"* (Bussiere, col.6, lines 41-50). Hence, Bussiere teaches of the ingress device (e.g., "mirror-to-port" 14) (i.e., Applicants' entry device) is set up (i.e., Applicants' configured) with a path through the use of source and destination addresses (i.e., Applicants' destination IP address) so

that data is forwarded to the egress device (i.e., Applicants' destination which mirror the data packet, remote exit device).

- *generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address; and* (Bussiere, col.1, line 5 – col.10, line 65)

  Bussiere discloses, *"According to a method embodiment, the invention comprises the steps of: selecting a first port of a first device from which to mirror packets; selecting a first port of a second device to which to mirror the packets; and mirroring the packets from the first port of the first device to the first port of the second device by encapsulating the packets and sending the encapsulated packets through the network to the second device. The first device encapsulates the packets, enabling them to be transmitted out the network to the second device; the second device de-encapsulates the encapsulated packets, and provides the same to an analyzer. The mirroring step may include establishing a connection path through a switched network from the first device to the second device and sending the encapsulated packets on the path. The step of encapsulating the packets may include adding a header which identifies the connection path"* (Bussiere, col.2, lines 27-46). Hence, Bussiere teaches of the first device (i.e., Applicants' entry device) encapsulating the packets (i.e., Applicants' data packet) by including (i.e., Applicants' adding) headers identifying (i.e., Applicants' includes) the address of the destination (i.e., Applicants' destination address) device.

- *forwarding the IP-encapsulated packet to an exit device associated with the destination IP address.* (Bussiere, col.1, line 5 – col.10, line 65)

Bussiere discloses, *"According to a method embodiment, the invention comprises the steps of: selecting a first port of a first device from which to mirror packets; selecting a first port of a second device to which to mirror the packets; and mirroring the packets from the first port of the first device to the first port of the second device by encapsulating the packets and sending the encapsulated packets through the network to the second device. The first device encapsulates the packets, enabling them to be transmitted out the network to the second device; the second device de-encapsulates the encapsulated packets, and provides the same to an analyzer. The mirroring step may include establishing a connection path through a switched network from the first device to the second device and sending the encapsulated packets on the path. The step of encapsulating the packets may include adding a header which identifies the connection path"* (Bussiere, col.2, lines 27-46). Hence, Bussiere teaches of the first device (i.e., Applicants' entry device) encapsulating the packets (i.e., Applicants' data packet) by including (i.e., Applicants' adding) headers identifying (i.e., Applicants' includes) the address of the destination (i.e., Applicants' destination address) device and transmitting (i.e., Applicants' forwarding) them (i.e., Applicants' encapsulated packet) to the second device (i.e., Applicants' exit device) through the network based on the destination address (i.e., Applicants' associated with the destination address).

However, Bussiere does not explicitly disclose,

- <u>*generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address;*</u>

- *forwarding the IP-encapsulated packet to an exit device associated with the destination IP address; and*

Amara teaches,

- *generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address;* (Amara, col.1, line 7 – col.18, line 38)

  Amara discloses, *"IP can be used to send data between devices on the same network and between devices on different networks. For IP communications, a device is generally assigned a 32-bit IP address. The IP address is generally globally unique across the connected networks, and this allows the destination device to be uniquely identified by its IP address. Data is transmitted in an IP packet. The IP packet includes a header portion and a data portion"* (Amara, col.3, lines 31-38). Amara discloses, *"The virtual tunnel 126 can be created by encapsulating a data packet inside another data packet and by adding additional tunnel packet headers"* (Amara, col.6, lines 43-45). Hence, Amara implies of IP encapsulating data packets using IP headers and transmitting them to the destination based on the destination IP address of the IP header through devices on different networks.

- *forwarding the IP-encapsulated packet to an exit device associated with the destination IP address; and* (Amara, col.1, line 7 – col.18, line 38)

  Amara discloses, *"IP can be used to send data between devices on the same network and between devices on different networks. For IP communications, a device is generally assigned a 32-bit IP address. The IP address is generally globally unique across the connected networks, and this allows the destination*

device to be uniquely identified by its IP address. Data is transmitted in an IP packet. The IP packet includes a header portion and a data portion" (Amara, col.3, lines 31-38). Amara discloses, *"The virtual tunnel 126 can be created by encapsulating a data packet inside another data packet and by adding additional tunnel packet headers"* (Amara, col.6, lines 43-45). Hence, Amara implies of IP encapsulating data packets using IP headers and transmitting them to the destination based on the destination IP address of the IP header through devices on different networks.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Amara with the teachings of Bussiere *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with

the teachings of Amara to send data packets between different networks via IP encapsulation.

However, Bussiere and Amara do not explicitly disclose,

- *receiving by an entry device a data packet to be remotely mirrored <u>from the first network layer 2 domain,</u> wherein the entry device is pre-configured with a destination Internet Protocol (IP) address to which to mirror the data packet, and the destination IP address is associated with a remote exit device <u>in the second network layer 2 domain;</u>*

Zhang teaches,

- *receiving by an entry device a data packet to be remotely mirrored <u>from the first network layer 2 domain,</u> wherein the entry device is pre-configured with a destination Internet Protocol (IP) address to which to mirror the data packet, and the destination IP address is associated with a remote exit device <u>in the second network layer 2 domain;</u>* (Zhang, col.1, line 6 – col.16, line 33)

  Zhang discloses, *"Once the Layer 2 tunnel is setup and a necessary link is established, the LNS typically assigns an IP address to an authenticated client, and sends it to the network access device over the Layer 2 tunnel. The network access device receives the IP address and transfers it to the client (129)."* (Zhang, col.9, lines 20-24). Hence, Zhang teaches of communicating between networks through layer 2 encapsulation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Zhang with the teachings of Bussiere and Amara *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere

discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation.

However, Bussiere, Amara, and Zhang do not explicitly disclose,

- *truncating the data packet to reduce a size of the IP-encapsulated packet prior to forwarding thereof.*

Regan teaches,

- *truncating the data packet to reduce a size of the IP-encapsulated packet prior to forwarding thereof.* (Regan, para.1-36)

  Regan discloses, *"Using a mirror service configured to send mirror packets via a primary network could increase congestion on the primary network, e.g., by interfering with the ability of a network to fulfill quality of service guarantees for transport services (e.g., VLAN) provided via the primary network. In some*

embodiments, the effect of mirror service traffic is minimized by "slicing" oversized mirror packets, which reduces processing and time requirements, alleviating performance impacts. Mirror packets are truncated prior to being sent to a mirror destination. Truncation minimizes replication and tunneling overhead associated with transmitting packets to a mirror destination. In some embodiments, rate limiting is used to minimize the impact of mirror service packets on the performance of other services being provided using the network by limiting the rate at which mirror packets are sent via the mirror service. Rate limiting may be implemented with user or system specified limits, and may be dynamic, i.e., the permitted rate for the mirror service may change as conditions change, e.g., the extent to which QoS guarantees are being met" (Regan, para.30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Regan with the teachings of Bussiere, Amara, and Zhang *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber*

optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh" (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation. In addition, Regan discloses, *"In some embodiments, the effect of mirror service traffic is minimized by "slicing" oversized mirror packets, which reduces processing and time requirements, alleviating performance impacts. Mirror packets are truncated prior to being sent to a mirror destination. Truncation minimizes replication and tunneling overhead associated with transmitting packets to a mirror destination"* (Regan, para.30).

17. Claim 29 are rejected under 35 U.S.C. 103(a) as being unpatentable over Bussiere (US006041042A), in view of Amara et al. (US006839338B1), in view of Zhang et al. (US006985935B1), in view of Regan (US 20040213232A1), and further in view of Ni (US007042843B2),

18. With regard to *claim 29*, Bussiere discloses,

- *an entry device configured to receive from the local network layer 2 domain a data packet to be remotely mirrored to a remote exit device in the remote network layer 2 domain;* (Bussiere, col.1, line 5 – col.10, line 65)
  Bussiere discloses, *"FIG. 2 illustrates, by way of example, part of a network system in which a source device is monitored by a remote analyzer. The source device is referred to as an ingress device 15 for so long as the device is being*

monitored, and can be any one of the network communication devices (e.g., devices 1-4, 6 and 9 in FIG. 1). Ingress device 15 may have multiple ports through which packets may be received and sent. In FIG. 2, port 13 has been selected as the port to be monitored. Thus, in this example, device 15 is the ingress device and port 13 is the "mirror-from-port." A "mirror-to-port" 14 is the out port on ingress device 15 that is on a path 12 set up through the connection-oriented network 10 to the egress device 18. All packets received and sent by the port 13 are also copied and transmitted through the network 10 to analyzer 5, located off analyzer port 11 of egress device 18. The "egress device" is the device on the network that is used to monitor the mirror-from-port 13 on the ingress device 15. Any device may be selected as the egress device" (Bussiere, col.4, line 66 – col.5, line 17). Hence, Bussiere teaches of the ingress device 15 (i.e., Applicants' entry device) receiving packets (i.e., Applicants' data packet) that are being monitored through port 13 (e.g., "mirror-from-port") (i.e., Applicants' to be monitored) and transmitting them through "mirror-to-port" 14 to the egress device 18 (i.e., Applicants' remote mirrored device). Bussiere discloses, *"In step 41, a port on a device in the network is selected to be monitored (i.e., a device is designated as an ingress device). Special hardware (and/or software) is set-up in the ingress device (e.g., 15), defining one port (e.g., port 13) as the "mirror-from-port" and one port (e.g., port 14) as "mirror-to-port". In step 42, frame encapsulation logic (e.g., 15') is set up in the ingress device (e.g., 15). In step 43, a path, (e.g., path 12), is set-up from a specific out-port of the ingress device (e.g., "mirror-to-port" 14) through the trunk devices (e.g., 16 and 17) to the egress device (e.g., 18)"* (Bussiere, col.6, lines 41-50). Hence,

Bussiere teaches of the ingress device (e.g., “mirror-to-port” 14) (i.e., Applicants’ entry device) is set up (i.e., Applicants’ configured) with a path through the use of source and destination addresses (i.e., Applicants’ destination IP address) so that data is forwarded to the egress device (i.e., Applicants’ destination which mirror the data packet, remote exit device).

- *a configuration file in the entry device, where the configuration file stores a destination Internet Protocol (IP) address to which to mirror the data packet;* (Bussiere, col.1, line 5 – col.10, line 65)

  Bussiere discloses, *“In step 41, a port on a device in the network is selected to be monitored (i.e., a device is designated as an ingress device). Special hardware (and/or software) is set-up in the ingress device (e.g., 15), defining one port (e.g., port 13) as the "mirror-from-port" and one port (e.g., port 14) as "mirror-to-port". In step 42, frame encapsulation logic (e.g., 15') is set up in the ingress device (e.g., 15). In step 43, a path, (e.g., path 12), is set-up from a specific out-port of the ingress device (e.g., "mirror-to-port" 14) through the trunk devices (e.g., 16 and 17) to the egress device (e.g., 18)”* (Bussiere, col.6, lines 41-50). Hence, Bussiere teaches of the ingress device (e.g., “mirror-to-port” 14) (i.e., Applicants’ entry device) is set up (i.e., Applicants’ configured) with a path through the use of source and destination addresses (i.e., Applicants’ destination IP address) so that data is forwarded to the egress device (i.e., Applicants’ destination which mirror the data packet, remote exit device).

- *<u>a remote mirroring engine for generating and adding an</u> IP <u>header to</u> IP <u>encapsulate the data packet, wherein the</u> IP <u>header includes the destination</u> IP <u>address,</u> for reducing size of the data packet to accommodate the added IP*

header, <u>and for having the</u> IP-<u>encapsulated packet forwarded towards a remote exit device associated with the destination</u> IP <u>address.</u> (Bussiere, col.1, line 5 – col.10, line 65)

Bussiere discloses, *"According to a method embodiment, the invention comprises the steps of: selecting a first port of a first device from which to mirror packets; selecting a first port of a second device to which to mirror the packets; and mirroring the packets from the first port of the first device to the first port of the second device by encapsulating the packets and sending the encapsulated packets through the network to the second device. The first device encapsulates the packets, enabling them to be transmitted out the network to the second device; the second device de-encapsulates the encapsulated packets, and provides the same to an analyzer. The mirroring step may include establishing a connection path through a switched network from the first device to the second device and sending the encapsulated packets on the path. The step of encapsulating the packets may include adding a header which identifies the connection path"* (Bussiere, col.2, lines 27-46). Hence, Bussiere teaches of the first device (i.e., Applicants' entry device) encapsulating the packets (i.e., Applicants' data packet) by including (i.e., Applicants' adding) headers identifying (i.e., Applicants' includes) the address of the destination (i.e., Applicants' destination address) device.

However, Bussiere does not explicitly disclose,

- *<u>a remote mirroring engine for generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address,</u> for reducing size of the data packet to accommodate the added IP*

header, and for having the IP-encapsulated packet forwarded towards a remote exit device associated with the destination IP address.

Amara teaches,

- *a remote mirroring engine for generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address, for reducing size of the data packet to accommodate the added IP header, and for having the IP-encapsulated packet forwarded towards a remote exit device associated with the destination IP address.* (Amara, col.1, line 7 – col.18, line 38)

  Amara discloses, *"IP can be used to send data between devices on the same network and between devices on different networks. For IP communications, a device is generally assigned a 32-bit IP address. The IP address is generally globally unique across the connected networks, and this allows the destination device to be uniquely identified by its IP address. Data is transmitted in an IP packet. The IP packet includes a header portion and a data portion"* (Amara, col.3, lines 31-38). Amara discloses, *"The virtual tunnel 126 can be created by encapsulating a data packet inside another data packet and by adding additional tunnel packet headers"* (Amara, col.6, lines 43-45). Hence, Amara implies of IP encapsulating data packets using IP headers and transmitting them to the destination based on the destination IP address of the IP header through devices on different networks.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Amara with the teachings of Bussiere *"to send data between devices on the same network and between devices*

on different networks" (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via IP encapsulation.

However, Bussiere and Amara do not explicitly disclose,

- *an entry device configured to receive from the <u>local network layer 2 domain</u> a data packet to be remotely mirrored to a remote exit device in the <u>remote network layer 2 domain;</u>*

Zhang teaches,

- *an entry device configured to receive from the <u>local network layer 2 domain</u> a data packet to be remotely mirrored to a remote exit device in the <u>remote network layer 2 domain;</u>* (Zhang, col.1, line 6 – col.16, line 33)

Zhang discloses, *"Once the Layer 2 tunnel is setup and a necessary link is established, the LNS typically assigns an IP address to an authenticated client, and sends it to the network access device over the Layer 2 tunnel. The network access device receives the IP address and transfers it to the client (129)."* (Zhang, col.9, lines 20-24). Hence, Zhang teaches of communicating between networks through layer 2 encapsulation.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Zhang with the teachings of Bussiere and Amara *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation.

However, Bussiere, Amara, and Zhang do not explicitly disclose,

- *a remote mirroring engine for generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address, <u>for reducing size of the data packet to accommodate the added IP header,</u> and for having the IP-encapsulated packet forwarded towards a remote exit device associated with the destination IP address.*

Regan teaches,

- *a remote mirroring engine for generating and adding an IP header to IP encapsulate the data packet, wherein the IP header includes the destination IP address, <u>for reducing size of the data packet to accommodate the added IP header,</u> and for having the IP-encapsulated packet forwarded towards a remote exit device associated with the destination IP address.* (Regan, para.1-36)
Regan discloses, *"Using a mirror service configured to send mirror packets via a primary network could increase congestion on the primary network, e.g., by interfering with the ability of a network to fulfill quality of service guarantees for transport services (e.g., VLAN) provided via the primary network. In some embodiments, the effect of mirror service traffic is minimized by "slicing" oversized mirror packets, which reduces processing and time requirements, alleviating performance impacts. Mirror packets are truncated prior to being sent to a mirror destination. Truncation minimizes replication and tunneling overhead associated with transmitting packets to a mirror destination. In some embodiments, rate limiting is used to minimize the impact of mirror service packets on the performance of other services being provided using the network by limiting the rate at which mirror packets are sent via the mirror service. Rate*

> *limiting may be implemented with user or system specified limits, and may be dynamic, i.e., the permitted rate for the mirror service may change as conditions change, e.g., the extent to which QoS guarantees are being met"* (Regan, para.30).

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Regan with the teachings of Bussiere, Amara, and Zhang *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation. In addition, Regan discloses, *"In some embodiments, the effect of mirror service traffic is minimized by "slicing" oversized mirror packets, which reduces processing and time requirements,*

alleviating performance impacts. Mirror packets are truncated prior to being sent to a mirror destination. Truncation minimizes replication and tunneling overhead associated with transmitting packets to a mirror destination" (Regan, para.30).

However, Bussiere, Amara, Zhang, and Regan do not explicitly disclose,

- *configuring the entry device in a best effort mirroring mode to reduce head-of-line blocking.*

Ni teaches,

- *configuring the entry device in a best effort mirroring mode to reduce head-of-line blocking.* (Ni, col.1, line 10 – col.14, line 40)

  Ni discloses, *"The issue then becomes how does a system manage the scheduling of the transmission of the packets so that no voice or video transmission interval violation occurs and no best effort starvation occurs. An embodiment of the invention addresses this issue by providing a method to restrict the total number of active class of services (flows) for voice and video packets so that 1) the maximum wait time for any port's voice/video queue is less than or equal to the maximum transmission interval (i.sub.m), 2) the process of interleaving voice, video and best effort traffic does not delay the transmission of the next voice/video packet transmit time, and 3) the process does not starve the video and best effort traffic for service"* (Ni, col.7, lines 17-29). Hi discloses, *"HOL blocking is a phenomenon that may occur in an input buffered switch wherein a packet is temporarily blocked by another packet or packets either at the input buffer or at the output buffer. HOL reduces the effectiveness of the transfer rate. One of the objectives of flow control is to inhibit the sending station or host from sending additional packets to a congested port for a predetermined*

amount of time. While a flow control scheme is expected to ease congestion, it may also aggravate the Head-of-Line (HOL) blocking problem by causing additional transmission delays" (Ni, col.7, lines 7-16). Hence, Ni teaches of utilizing best effort transmission method among others to avoid that starvation of best effort traffic for service and reducing the head-of-line (HOL) blocking and congestion problems.

Therefore, it would have been obvious to one of ordinary skill in the art at the time of the invention was made to combine the teachings of Ni with the teachings of Bussiere, Amara, Zhang, and Regan *"to send data between devices on the same network and between devices on different networks"* (Amara, col.3, lines 31-32). Bussiere discloses, *"As businesses have realized the economic advantages of sharing expensive computer resources, cabling systems (both physical and wireless) have proliferated to enable the sharing of such resources over a network. A local area network, or 'LAN', refers to an interconnected data network that is usually confined to a moderately-sized geographical area, such as a single office building or a campus area. Larger networks are often referred to as wide area networks or 'WANs'. Networks may be formed using a variety of different interconnection elements, such as unshielded twisted pair cables, shielded twisted pair cables, coaxial cable, fiber optic cable, and wireless interconnection elements. The configuration of these cabling elements, and the interfaces for the communications medium, may follow one or more topologies such as a star, ring, bus or mesh"* (Bussiere, col.1, lines 13-28). Hence, Bussiere suggests of communicating between networks, providing motivation to combine with the teachings of Amara to send data packets between different networks via layer 2 IP encapsulation. Ni discloses, *"The*

issue then becomes how does a system manage the scheduling of the transmission of the packets so that no voice or video transmission interval violation occurs and no best effort starvation occurs" (Ni, col.7, lines 17-20).

Response to Arguments

19. Applicant's arguments with respect to *claims 1, 15, 18, 26, and 29* have been considered but are moot in view of the new ground(s) of rejection.

Conclusion

20. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Thomas Duong whose telephone number is 571/272-3911. The examiner can normally be reached on M-F 7:30AM - 4:00PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason D. Cardone can be reached on 571/272-3933. The fax phone numbers for the organization where this application or proceeding is assigned are 571/273-8300 for regular communications and 571/273-8300 for After Final communications.

Thomas Duong (AU2145)

March 29, 2008

/Jason D Cardone/
Supervisory Patent Examiner, Art Unit 2145